

REMARKS

Claims 1-3 and 6-22 are all the claims presently pending in the application. Claims 4-5 have been canceled. Claims 1 and 3 have been amended to more particularly define the claimed invention. Claims 6-22 have been added to claim additional features of the claimed invention.

It is noted that the amendments are made only to overcome the Examiner's non-statutory objections, and to more particularly define the invention and not for distinguishing the invention over the prior art, for narrowing the scope of the claims, or for any reason related to a statutory requirement for patentability. It is further noted that, notwithstanding any claim amendments made herein, Applicant's intent is to encompass equivalents of all claim elements, even if amended herein or later during prosecution.

Claims 1-3 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Ishibashi (JP 2001-196641) in view of Susumu et al. (JP 08-330637) and further in view of Okazaki (US 2002/0024299).

This rejection is respectfully traversed in view of the following discussion.

I. THE CLAIMED INVENTION

The claimed invention (e.g., as recited in claim 1) is directed to a light-emitting diode (LED) lamp which includes a substrate coated with a metal pattern formed as an electrically conducting portion including films of copper (Cu), nickel (Ni) and gold (Au) laminated successively in this order on the substrate, a resin frame member fixed onto the substrate through an adhesive agent, a light-emitting element fixed into a frame of the resin frame member on the substrate so as to be electrically connected to the metal pattern, a resist bonded onto a nickel-free or gold-free surface of the copper film of the metal pattern to form such a structure that the resist is at least partially formed between the substrate and the resin frame member, and a light-transmissive resin packed in the frame of the resin frame member to seal the light-emitting element with the light-transmissive resin.

To avoid cracking a metal pattern 14, 15, 16 during formation of a resin sealing portion, a related art LED lamp includes a resist 3 formed between a metal pattern 14, 15, 16 and a resin

sealing portion (Application at page 1, line 18-page 2, line 11). However, the resist 3 does not adhere well to a gold layer of the metal pattern, so the resist 3 separates from the metal pattern 14, 15, 16 (Application at Figure 5B).

An exemplary aspect of the claimed invention, on the other hand, may include a resist bonded onto a nickel-free or gold-free surface of the copper film of the metal pattern to form such a structure that the resist is at least partially formed between the substrate and the resin frame member (Application at Figures 1, 3; page 11, lines 4-15). The resist may adhere well to the copper film, which may help to prevent the resist from separating from the metal pattern (Application at page 15, lines 3-13).

II. THE ALLEGED PRIOR ART REFERENCES

The Examiner alleges that Ishibashi would have been combined with Susumu and Okazaki to form the invention of claims 1-3. Applicant submits, however, that these alleged references would not have been combined and even if combined, the combination would not teach or suggest each and every feature of the claimed invention.

Ishibashi discloses a semiconductor device which includes a luminescence equipment of a surface mold mount, which includes a resin package 6 and a light-emitting device 4 (Ishibashi at Figure 2).

Susumu discloses an LED lamp which includes a solder resist film 7 formed between a conductive pattern 3 and a molded part 6 (Susumu at Figure 6).

Okazaki discloses a chip-type light-emitting device which includes a reflective case 5 formed on a chip substrate 4 (Okazaki at Figure 2).

However, Applicant submits that these alleged references are unrelated. Indeed, Ishibashi is intended to **prevent solder 53 from permeating a resin package 6** by forming a notching slot 7 in a copper plating (Ishibashi at [0009]-[00012]), whereas Susumu is intended to **prevent a terminal part 3a from being cracked** by forming a solder resist film 7 on the substrate 2 (Susumu at Abstract), and Okazaki is intended to **prevent a leakage current** by using a light-shielding member which shields a diode from light (Okazaki at [0021]). Clearly, no person of ordinary skill in the art would have considered combining these disparate references,

absent impermissible hindsight.

In fact, Applicant submits that the references provide no motivation or suggestion to urge the combination as alleged by the Examiner. Indeed, these references clearly do not teach or suggest their combination. Therefore, Applicant respectfully submits that one of ordinary skill in the art would not have been so motivated to combine the references as alleged by the Examiner. Therefore, the Examiner has failed to make a prima facie case of obviousness.

Moreover, neither Ishibashi, nor Susumu, nor Okazaki, nor any alleged combination teaches or suggests "*a resist bonded onto a nickel-free or gold-free surface of the copper film of the metal pattern to form such a structure that the resist is at least partially formed between the substrate and the resin frame member*", as recited, or example, in claim 1 (Application at Figures 1, 3; page 11, lines 4-15). As noted above, the resist may adhere well to the copper film, which may help to prevent the resist from separating from the metal pattern (Application at page 15, lines 3-13).

Clearly, this novel feature is not taught or suggested by the cited references. Indeed, **the Examiner expressly concedes that Ishibashi does not teach or suggest this feature on page 3 of the Office Action**, but alleges that Susumu teaches a resist and Okazaki teaches a resin frame member. Applicant submits, however, that the Examiner's assertions are unreasonable.

Indeed, Applicant would point out that Susumu is discussed in detail in the Background section of the Application. Specifically, the Application states that Susumu discloses an LED lamp which includes a resist film formed between a metal pattern and a molded part, **but the resist film does not adhere well to the metal pattern, so the resist separates from the metal pattern** (Application at Figure 5B; Susumu at Figure 6).

Thus, Susumu clearly does not teach or suggest a resist bonded onto a surface of a copper film of the metal pattern, as in the claimed invention. Instead, as noted above, Susumu teaches simply that the solder resist film 7 is formed between a conductive pattern 3 and a molded part.

Further, the Examiner surprisingly alleges that the "Susumu resist will be displaced over Ishibashi's exposed nickel-free or gold-free surface of the copper film". That is, the Examiner is alleging that the resist would be formed in the notching slot 7 in the Ishibashi device. However, **Applicant would point out that forming the resist in the notching slot 7 as alleged by the**

Examiner would defeat the sole purpose of the notching slot 7 (i.e., preventing solder 53 from permeating a resin package 6 during a flow mounting).

Further, Susumu does not even teach or suggest a resin frame member and therefore, as conceded by the Examiner on page 3 of the Office Action, Susumu clearly does not teach or suggest a resist that is at least partially formed between the substrate and the resin frame member. Thus, Susumu is unrelated to the claimed invention and does not make up for the deficiencies of Ishibashi.

Further, Okazaki clearly does not teach or suggest this feature of the claimed invention. Indeed, Okazaki merely teaches a reflective case 5 formed on a substrate 4. The Examiner surprisingly attempts to equate the reflective case 5 in Okazaki with the resin frame member of the claimed invention. The Examiner further states that "*Susumu's resist ... is at least partially put between the substrate and the resin frame member because the resist is further originally displaced on an area external to Susumu's mold section*". This assertion is clearly unreasonable.

Indeed, Applicant would point out that the Examiner earlier alleged that the Susumu resist would be formed in the notching slot 7 of Ishibashi. However, assuming arguendo that the resist would be formed in the notching slot 7 of Ishibashi, the resist would necessarily be formed under the resin package 6 in Ishibashi, and not under any frame member.

Further, there is clearly no support for the Examiner's assertion that "... the resist is further originally displaced on an area external to Susumu's mold section". Indeed, Susumu teaches only that "a resist is put between the metal pattern on the substrate and the resin sealing portion" (Application at page 2, lines 5-8). That is contrary to the Examiner's assertion, nowhere does Susumu or any of the other references teach or suggest forming a resist on an area external to Susumu's mold section.

Further, Applicant would point out that nowhere does Okazaki teach or suggest that the reflective case 5 is formed anywhere near a molded part formed on a light-emitting element. Indeed, Okazaki may teach forming a resin sealing member 82, but nowhere does Okazaki teach or suggest that the mold for forming the member 82 is near the reflective case 5 (e.g., see Okazaki at Figure 5D).

Therefore, it is clearly unreasonable to attempt to equate the solder resist film 7 in

Susumu with the resist of the claimed invention, and to attempt to equate the reflective case 5 in Okazaki with the resin frame member of the claimed invention. Therefore, Susumu and Okazaki clearly do not make up for the deficiencies in Ishibashi.

Therefore, Applicant submits that these references would not have been combined and even if combined, the combination would not teach or suggest each and every feature of the claimed invention. Therefore, Applicant respectfully request that the Examiner withdraw this rejection.

III. FORMAL MATTERS AND CONCLUSION

Applicant notes that the Title has been amended to address the Examiner's concerns.

In view of the foregoing, Applicant submits that claims 1-3 and 6-22, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Date: 6/20/06

Respectfully Submitted,



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